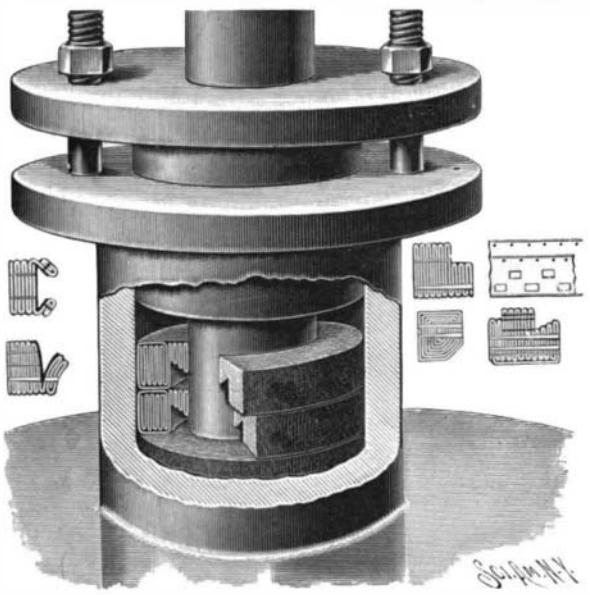
AN IMPROVED PACKING.

The illustration represents a packing in which a loose portion or flap engages and has a binding or conelike action on the rod, the other part forming a baffle space for the steam, to confine and prevent it from escaping. The improvement has been patented by James Walker, of James Walker & Company, engine and factory furnishers, Lion Works, Love Lane, Shadwell, London, England. The packing is made in a

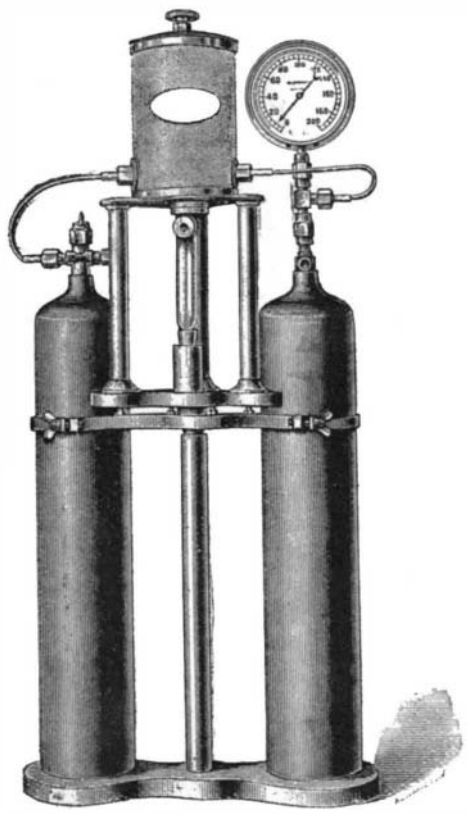


WALKER'S ROD PACKING.

variety of forms, a few of which are shown in the small figures, and is preferably composed of asbestos, asbestos wire cloth, canvas cloth, hemp, vulcanized fiber, wire gauze, sheet metal, etc., proofed to resist the action of steam or chemicals and folded into alternate or bellowslike layers. In one of the preferred forms the packing is folded to assume a subtantially rectangular cross section, while a flap or loose portion is left narrower than the thickness of the main part and forming a baffle space. The folds of the packing are held together by rivets, which in some cases have enlarged heads on the wearing side of the packing, adding to its durability. Spring plates are also in some cases used to lend resiliency to the flaps, and the strips of metal may be wound into the parts or folds of the packing, the whole tending to produce a packing having a maximum degree of tightness and a minimum of friction.

PROFESSOR DEWAR'S APPARATUS FOR LIQUEFYING AIR AND OXYGEN.

We illustrate below an interesting piece of apparatus for producing low temperatures, made by Messrs. Len-



PROFESSOR DEWAR'S APPARATUS FOR LIQUEFYING AIR AND OXYGEN.

nox, Reynolds & Fyfe, Rosebank Works, Fulham, and which is the outcome of many experiments carried on at the Royal Institution for the last three years. It is designed to reach the lowest temperatures hitherto attained, and embodies principles which, although thought by many to be new, have in reality been used by Professor Dewar in his large apparatus for the past five or six years. This little cooling plant requires no mechanical power, and is specially suited for laboratory use. It consists of two parts, viz., the refrigerator proper and two cylinders of compressed gases. The action is as follows: Liquid carbonic acid from one of the cylinders is ejected into a chamber, and cools a coil through which compressed air or oxygen from the other cylinder, at a pressure of 100 atmospheres or 150 atmospheres, is passed into what is now called a regenerating coil. At the bottom of this coil is a valve, peculiar in its construction, which expands the cooled gas into a vacuum jacketed vessel. The cooled gas then passes back over the regenerator, cooling the compressed gas below its critical point. The gas then commences to liquefy as it passes the valve.

Everything in such an apparatus depends on absolute isolation, or more heat will leak in than the small volume of gas used can take out; thus it is necessary to use vacuum vessels and to carefully proportion all metal parts. This apparatus, which was described by Professor Dewar before the Chemical Society, on January 19, is capable of producing 4 oz. of liquid oxygen at atmospheric pressure and a temperature of —180° Cent. in from 25 to 30 minutes. We are indebted to London Engineering for the cut and particulars.

Egyptian Cotton.

A recent report of the United States consul at Cairo draws attention to the steady increase in the amount of cotton shipped from Egypt to the United States. This has risen from 3,815 bales in 1885-86 to 50,000 bales—Egyptian bales of 750 pounds—equal to 75,000 American bales of 500 pounds weight.

To those who are not acquainted with the industry this looks like "shipping coals to Newcastle;" but as a matter of fact, owing to certain peculiarities of soil and climate, the Egyptian cotton has a fiber of extra length, which renders it indispensable in certain branches of manufacturing which have sprung up in the United States. The staple cotton from the Nile delta, varying from 1 inch to 1½ inches in length, is "matchless for fine threads where strength and luster of finish are essential." It is an excellent substitute for sea island cotton, and the report states that it can be had at a price so low in comparison that mill owners are venturing upon special manufactures hitherto controlled by British mills. Moreover, when it is mixed with American cotton, the latter can be put to a much more extended use.

The report further says: "That long fiber cotton is the staple of the future, is proved by the important value placed upon that of the Nile country by every manufacturing nation of the universe. The demand for it is growing with astonishing rapidity, and overproduction is an unlikely contingent. It seems to me that American agricultural genius should be exerted in order that our Southern States might give Northern and European spindles any and every staple required for finding a profitable market. Egypt is producing more and more cotton each year, and adding vastly to its cultivable area, every acre of which presumably will be devoted to cotton."

In addition to the 44,554 bales shipped in 1894-95 to the United States, Great Britain took 276,294 bales, Russia 132,309 bales, Austria 54.457 bales, France 46,242 bales, Italy 43,803 bales, Spain 19.007 bales, and minor shipments brought up the total to 639,582 bales of 750 pounds weight. This would be equal to about 1,000,000 American bales.

Ordinarily the Nile cotton fetches about two cents a pound more than the United States quotation; but land is costly, varying from $100 to $175 an acre, and rentals are enormous. Moreover, the Egyptian planter is taxed to the extent of $6 to $8 per acre, and he has to pay from 12 to 15 per cent interest on borrowed capital. From all which it is evident that the profits must be less than would at first be supposed. At the same time we learn that "gilt edge" cotton is "supporting the Egyptian government, paying the interest on the enormous debt owing to European creditors, and bringing $60,000,000 in ready money this season to a country that feeds itself, and exports cereals enough to keep a million more people."

It is suggested that seed should be purchased at the ginning establishments in Egypt and shipped to the States for experimental purposes; and that some of the bottom lands of the Mississippi Valley, and of the Brazos district in Texas, might offer analogous conditions, and be made to produce a fiber equal in quality, if not in quantity.

Seven-eighths of the cotton seed goes to England, as there are very few oil mills in Egypt, and what there are have an obsolete equipment. The great cost of freighting the seed would be saved by the establishment of mills on the spot, and the situation presents a promising opening for American up-to-date machinery and methods.

THE Orient Steam Navigation Company, Limited, propose to send one of their steamships of about 4,000 tons gross register to Vadsö, in the Varanger Fiord, Lapland (about 30° E. long.), to enable observations to be made on the total eclipse of the sun on August 9.

PRATT'S CONE BELT SHIFTER.

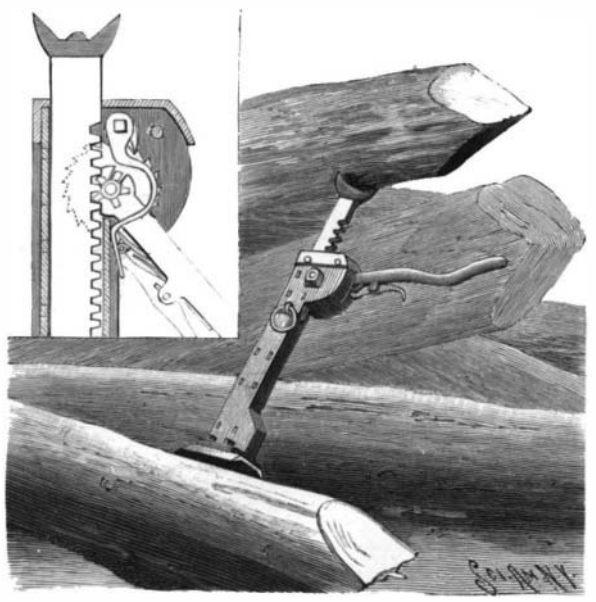
The cone belt shifter shown in accompanying illustration is very simple and easily applied in all places where cone pulleys are used. It is quick and effective in throwing belts from one cone to another. The cut represents the shifter applied to a lathe in connection with a belt which is perpendicular or nearly so. For horizontal or inclined belt a special shifter is made, and when the shipper rod of the countershaft is at the front, different sockets are used.

Further information with regard to this belt shifter may be obtained by addressing Chandler & Farquhar, 38 Federal Street, Boston, Mass. A large number of these belt shifters are in use by many of the leading manufacturers in this country, and we understand they are giving excellent satisfaction.

PRATT'S CONE BELT SHIFTER.

A NEW LOGGING JACK.

The illustration represents a simple and easily operated logging jack, to facilitate the handling of logs without danger to the workmen. It has been patented by John E. Gilchrist, of South Bend, Washington. The casing of the jack has a foot with lip carried all the way around, to enable the logger to take a side or other lift as desired, the casing being made completely of steel, and having a ring in one side to facilitate moving the jack about. The lifting rack sliding in the casing has at its upper end a head turning on a pivot, and the teeth of the rack, as shown in the sectional view, are in mesh with a pinion on a transverse shaft on which is a ratchet adapted to be engaged by a pawl fulcrumed in a lever which has a hooked end engaging the transverse shaft. The pawl is pivotally connected with a hand lever at one side of the working lever, a spring on the latter holding the pawl normally in engagement with the ratchet wheel. A dog engages the ratchet wheel to hold the load in raised position during the up or return stroke of the working lever, a gravity arm normally holding the dog in mesh with the ratchet wheel. The operator lifts the load by swinging the working lever up and down, and to lower the load, the gravity arm is moved to lift the dog out of engagement with the ratchet wheel; but if it is desired to suddenly lower the load or turn the lifting rack, both the gravity arm and pawl are swung outward to disengage the jack and the pawl from the ratchet wheel. The working parts are under perfect control of the operator, and there is no danger to the workmen when raising and lowering loads.



GILCHRIST'S LOGGING JACK.